Green Building at Vanderbilt University

October 2007

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COMMERCIAL REA

GOING GREEN

Environmental efficiency is actually the hottest trend in

Special Reprint Edition

USA TODAY

NO. 1 IN THE USA

As seen in USA TODAY

Money

July 26, 2006

Building 'green' reaches a new level

REAL ESTATE FINANCE

Real Estate's Latest Movement

green by DESIGN

The Gre

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Adobe has turned its headquarter

and is saving millions of d

The New York Times

Editorial

FRIDAY, AUGUST 11, 2006

Build Green,

Make Green

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The Greening of America's Campus

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ow campuses are built, and how students live

CONDOLiving

It's Easy Being Green

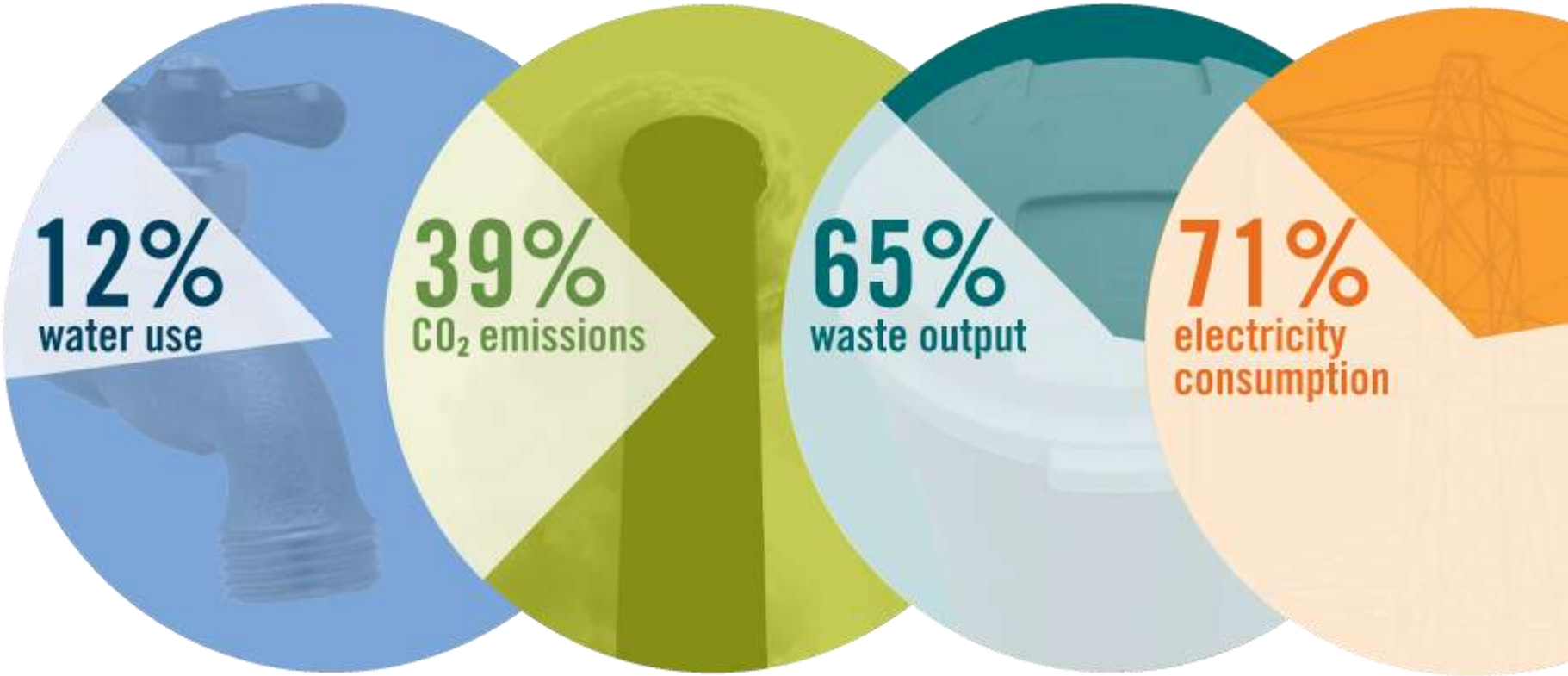
The Washington Post

REAL ESTATE

SATURDAY, APRIL 16, 2005

U.S. GREEN BUILDING COUNCIL USGBC

U.S. Building Impacts:



The Average Green Building Saves:

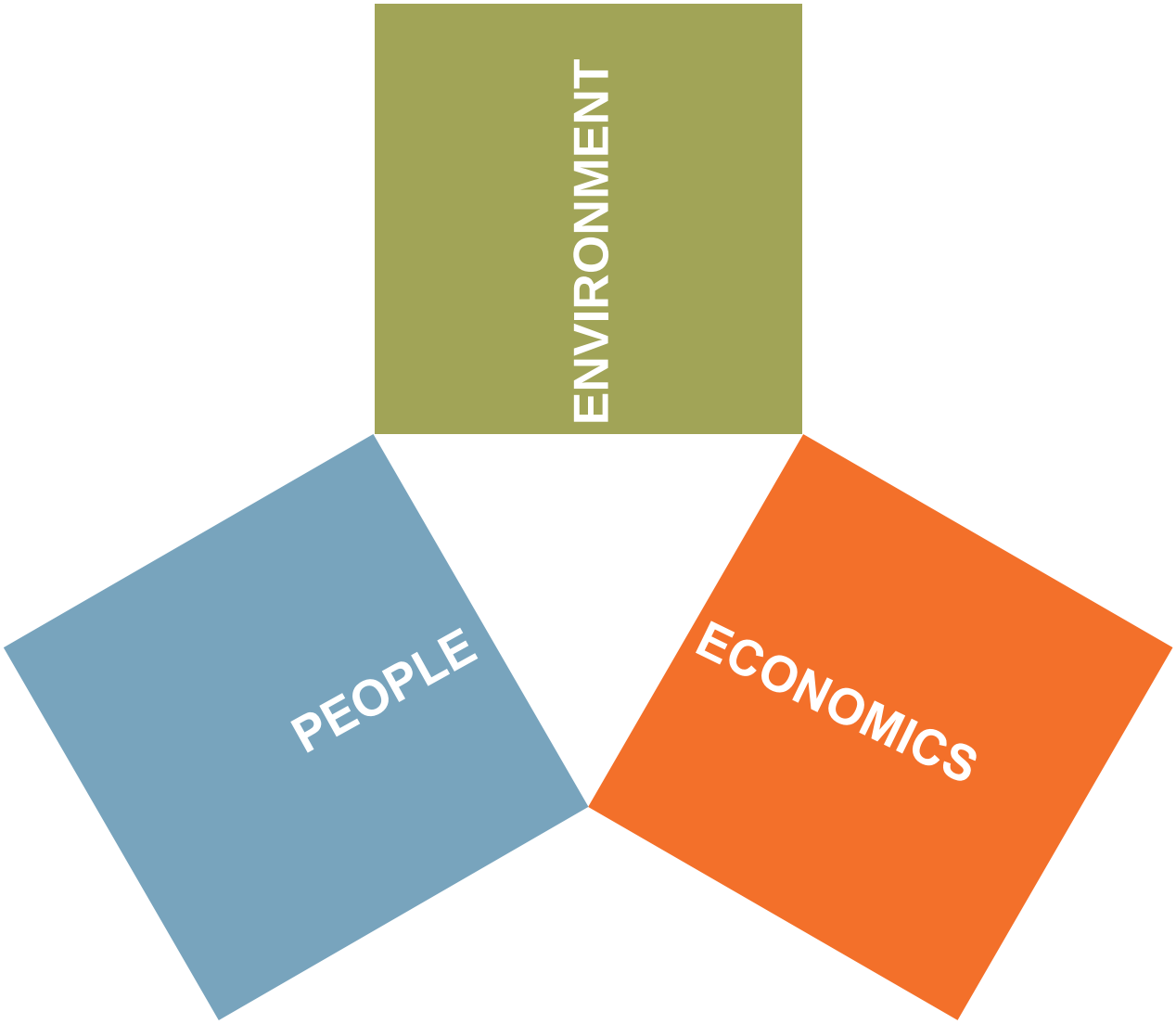
ENERGY SAVINGS	CO2 SAVINGS	WATER USE SAVINGS	WASTE COST SAVINGS
30%	35-50%	35-50%	50-90%

What is green building?

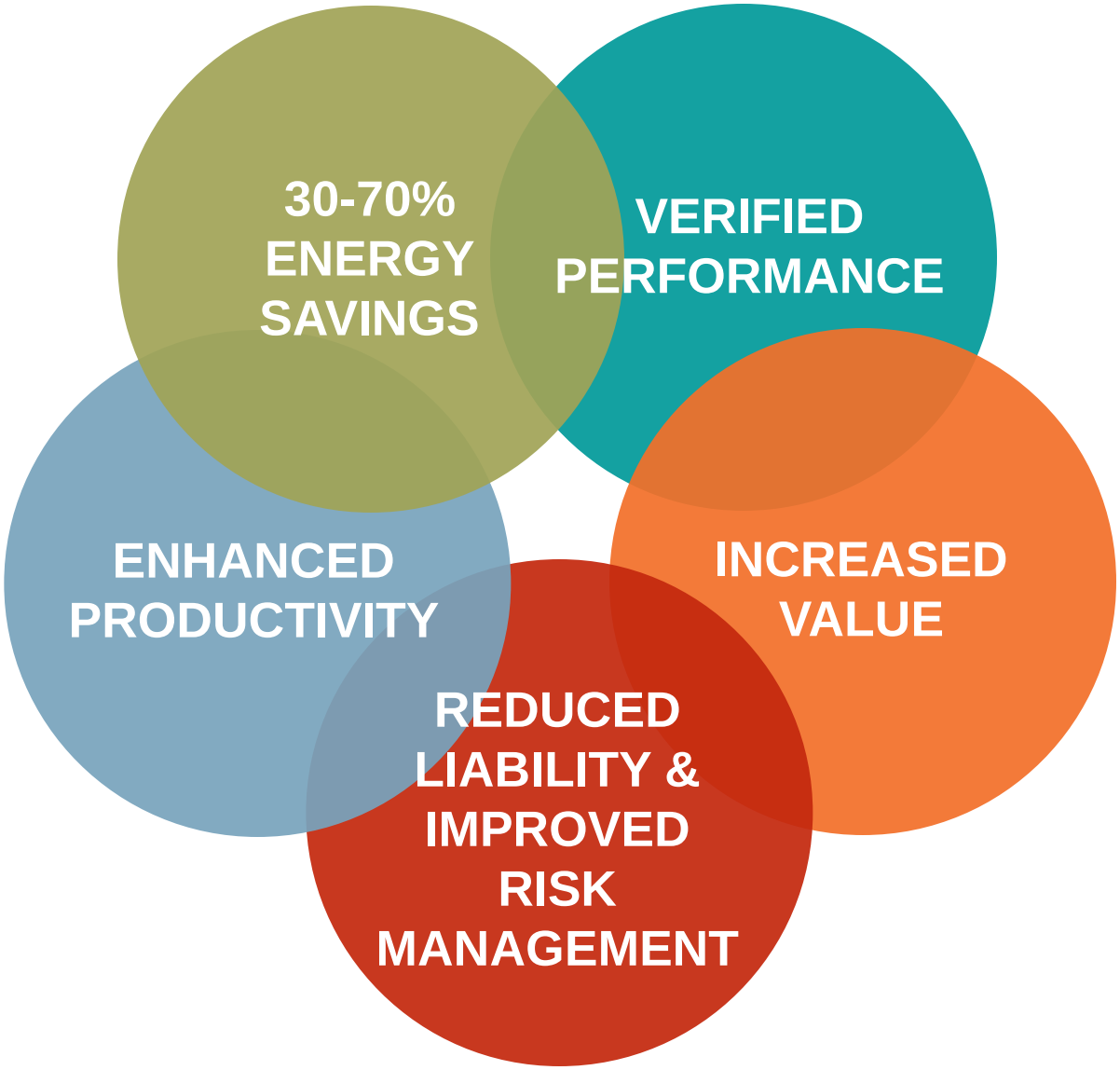
Design and construction practices that meet specified standards, resolving much of the negative impact of buildings on their occupants and on the environment.

The Triple Bottom Line

Reduced Environmental Impact.
Peak Efficiency.
Improved Capitalization Rates.
Increased Marketability.
Higher Lease Rates.
Improved Productivity.
Reduced Absenteeism.



Improved Bottom Line.



What is the LEED System?

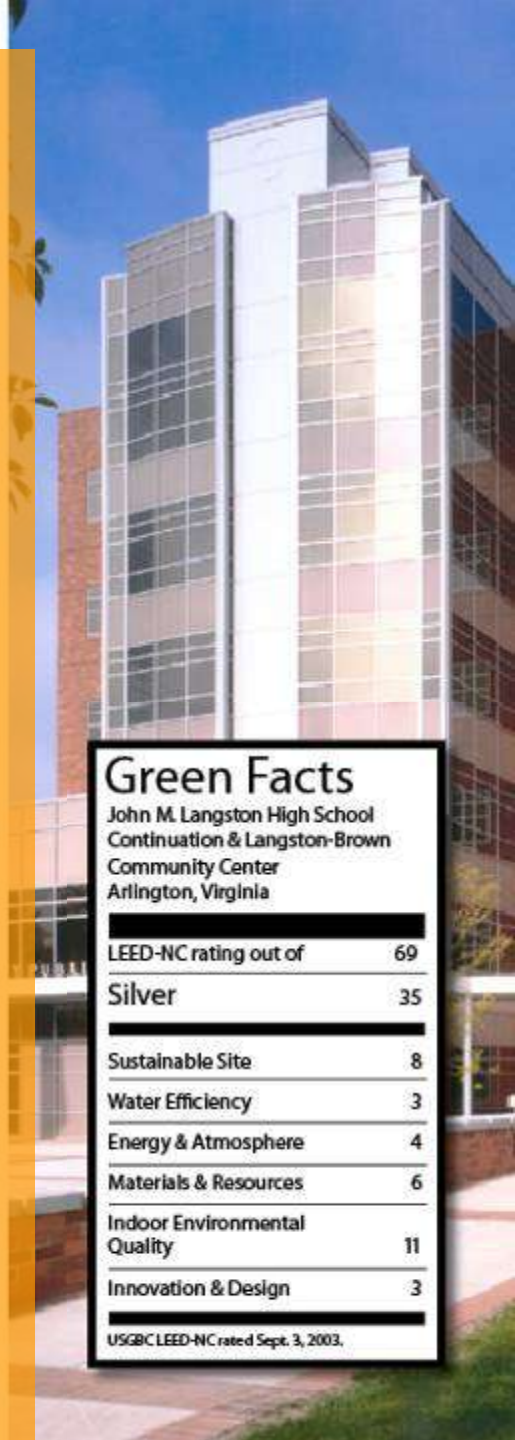
LEADERSHIP in ENERGY and ENVIRONMENTAL DESIGN

A leading-edge system for certifying DESIGN, CONSTRUCTION, & OPERATIONS of the greenest buildings in the world

Scores are tallied for different aspects of efficiency and design in appropriate categories.

For instance, LEED assesses in detail:

1. Site Planning
2. Water Management
3. Energy Management
4. Material Use
5. Indoor Environmental Air Quality
6. Innovation & Design Process



Traditional Building at Vanderbilt

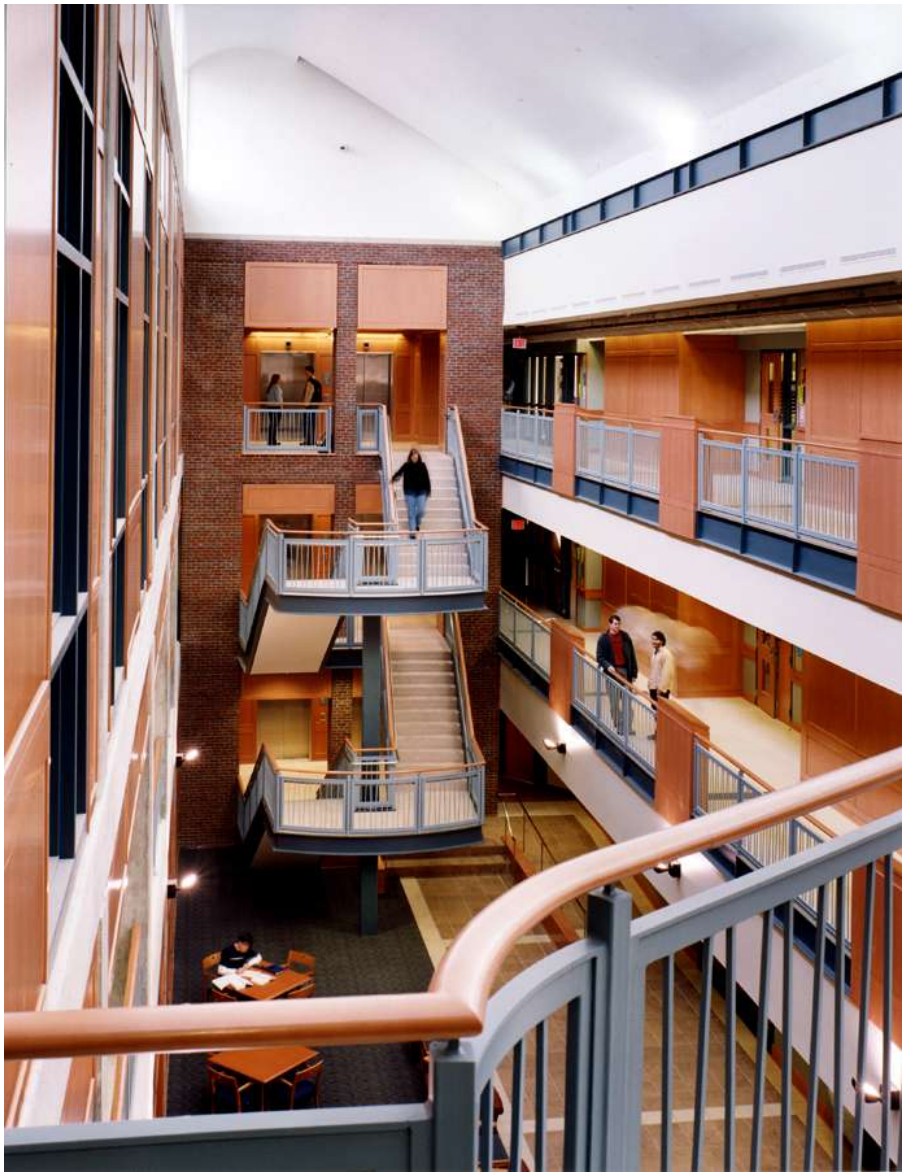
- Long term owner
- Quality construction
- Durable materials
- Central utilities
- Focus on energy efficiency and maintainability

Green Building Principles First Used

- Sustainable buildings are just good design
- A holistic approach considering many design aspects
- Integrating building systems
- Featheringill Hall started design in 1998

Featheringill Hall

- Major building reuse
- Natural daylight in most spaces
- Healthy finishes and materials
- All offices have views and operable windows
- Efficient HVAC
- Not LEED certified



Typical Campus Building Close to LEED

- An analysis of typical University building practices showed that they are near to LEED certified standards.

- LEED standards could be achieved through early planning and a focused approach without major cost increases.

Vanderbilt Transitions to LEED Buildings

- Students requested LEED certified buildings

- Sustainable design and construction practices have become more mainstream

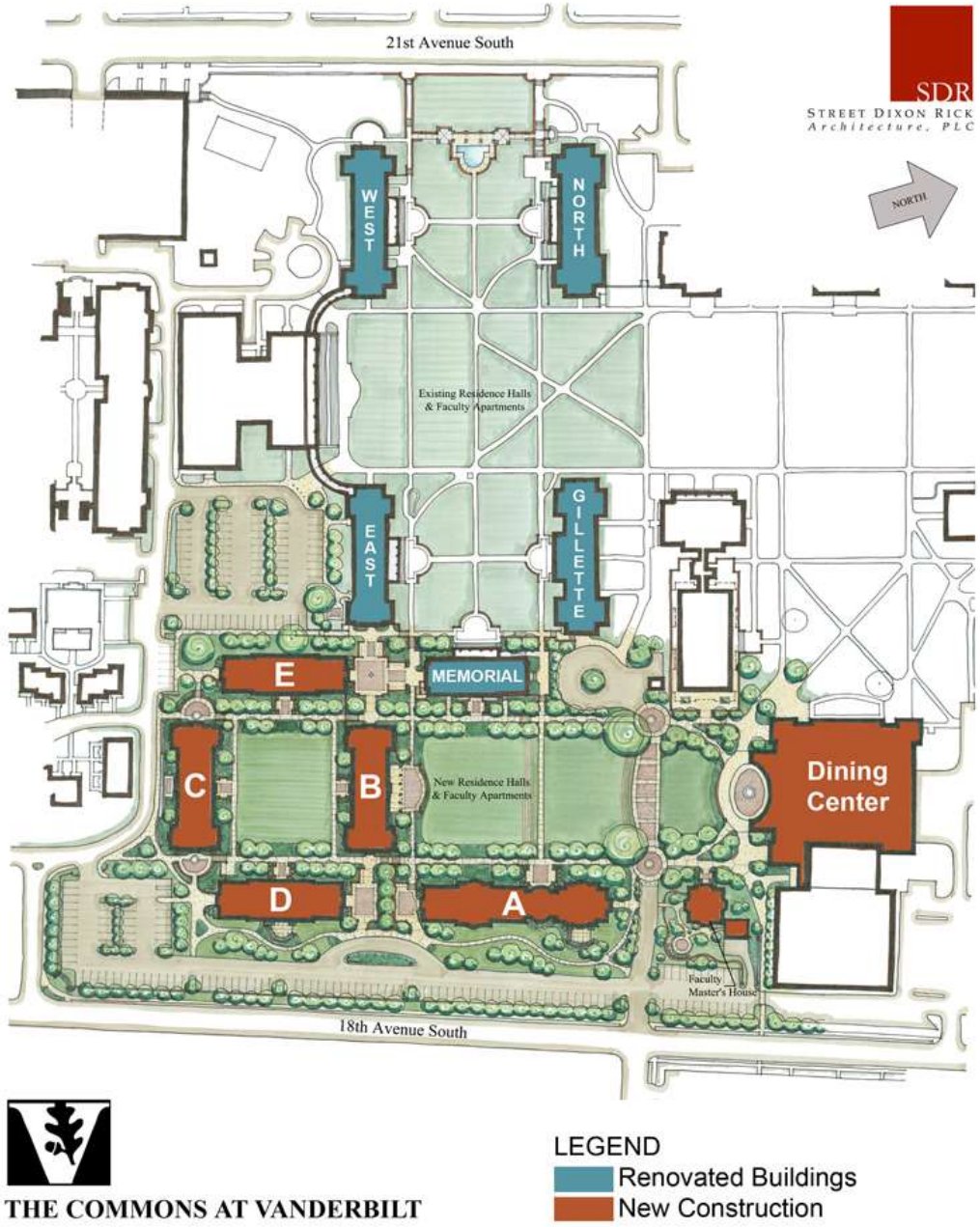
- Healthy building products have become more cost neutral

- 3rd party verification ensures quality performance

The Commons

- Opening in 2008
- 1600 first year students living with faculty
- Extended learning in the living environment
- Connecting academic and student life through special programs, lectures and dining together

The Commons Site



- 5 new residence houses
- 5 renovated residence houses
- Commons Center
- New utility infrastructure and chiller plant

Sutherland and Crawford LEED Silver

Finishes

- Recycled glass in terrazzo floors
- Renewable bamboo floors
- Low VOC paints, adhesives and sealants

Student Rooms

- Individual temperature controls
- Exterior daylight and views
- Operable windows

The Site

- Pervious pavement
- Storm water treatment
- Native landscaping

The Commons Center

The Commons Center

- 580 seat dining hall
- Commons community space
- Meeting rooms
- Market and cafe
- Academic support center
- Group study space
- Exercise and recreation room
- Post office
- Copy center
- Shell floor space for future programs

LEED Version 2.1 Project Checklist

Vanderbilt University - "The Commons", Dining Center

Sustainable Sites — 14 Points

Yes	?	No			
			Prereq 1	**Erosion & Sedimentation Control**	Required
1			Credit 1	**Site Selection**	1
1			Credit 2	**Development Density (LEED v2.2)**	1
		1	Credit 3	**Brownfield Redevelopment**	1
1			Credit 4.1	**Alt. Trans.**, Public Transportation Access	1
1			Credit 4.2	**Alt. Trans.**, Bicycle Storage & Changing Rooms	1
		1	Credit 4.3	**Alt. Trans.**, Alternative Fuel Vehicles	1
1			Credit 4.4	**Alt. Trans.**, Parking Capacity and Carpooling	1
1			Credit 5.1	**Reduced Site Disturbance**, Open Space	1
1			Credit 5.2	**Reduced Site Disturbance**, Development Footprint	1
1			Credit 6.1	**Stormwater Management**, Rate and Quantity	1
1			Credit 6.2	**Stormwater Management**, Treatment	1
1			Credit 7.1	**Reduce Heat Islands**, Non-Roof	1
1			Credit 7.2	**Reduce Heat Islands**, Roof	1
		1	Credit 8	**Light Pollution Reduction**	1

Water Efficiency — 5 Points

Yes	?	No			
	1		Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
		1	Credit 1.2	**Water Efficient Landscaping**, No Potable Use	1
		1	Credit 2	**Innovative Wastewater Technologies**	1
1			Credit 3.1	**Water Use Reduction**, 20% Reduction	1
1			Credit 3.2	**Water Use Reduction**, 30% Reduction	1

Energy & Atmosphere — 17 Points

Yes	?	No			
Y			Prereq 1	**Fundamental Building Commissioning**	Required
Y			Prereq 2	**Minimum Energy Performance**	Required
Y			Prereq 3	**CFC Reduction in HVAC&R Equipment**	Required
3			Credit 1	**Optimize Energy Performance**	1 to 10
		1	Credit 2.1	**Renewable Energy**, 5%	1
		1	Credit 2.2	**Renewable Energy**, 10%	1
		1	Credit 2.3	**Renewable Energy**, 20%	1
1			Credit 3	**Additional Commissioning**	1
1			Credit 4	**Ozone Depletion**	1
		1	Credit 5	**Measurement & Verification**	1
	1		Credit 6	**Green Power**	1

Materials & Resources — 13 Points

Yes	?	No			
Y			Prereq 1	**Storage & Collection of Recyclables**	Required
		1	Credit 1.1-3	**Building Reuse (not applicable)**	1
1			Credit 2.1	**Construction Waste Management**, Divert 50%	1
	1		Credit 2.2	**Construction Waste Management**, Divert 75%	1
		1	Credit 3.1	**Resource Reuse**, Specify 5%	1
		1	Credit 3.2	**Resource Reuse**, Specify 10%	1
1			Credit 4.1	**Recycled Content**, Specify 5%	1
	1		Credit 4.2	**Recycled Content**, Specify 10%	1
1			Credit 5.1	**Local/Regional Materials**, 20% Local	1
	1		Credit 5.2	**Local/Regional Materials**, of 20%, 50% Harvest	1
		1	Credit 6	**Rapidly Renewable Materials**	1
	1		Credit 7	**Certified Wood**	1

Indoor Environmental Quality — 15 Points

Yes	?	No			
Y			Prereq 1	**Minimum IAQ Performance**	Required
Y			Prereq 2	**Environmental Tobacco Smoke Control**	Required
1			Credit 1	**Carbon Dioxide (CO_2) Monitoring**	1
	1		Credit 2	**Ventilation Effectiveness (LEED v2.2)**	1
1			Credit 3.1	**Construction IAQ Plan**, During Construction	1
	1		Credit 3.2	**Construction IAQ Plan**, Before Occupancy	1
1			Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
1			Credit 4.2	**Low-Emitting Materials**, Paints	1
1			Credit 4.3	**Low-Emitting Materials**, Carpet	1
		1	Credit 4.4	**Low-Emitting Materials**, Composite Wood	1
1			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
		1	Credit 6.1	**Controllability of Systems**, Perimeter	1
		1	Credit 6.2	**Controllability of Systems**, Non-Perimeter	1
1			Credit 7.1	**Thermal Comfort**, ASHRAE 55-1992	1
1			Credit 7.2	**Thermal Comfort, (LEED v2.2)**	1
		1	Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
		1	Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1

Innovation & Design Process — 5 Points

Yes	?	No			
1			Credit 1.1	**ID: Education**	1
1			Credit 1.2	**ID: Kitchen Operations**	1
1			Credit 1.3	**ID: Alternative Trans. Management Plan**	1
	1		Credit 1.4	**ID: Green Housekeeping**	1
1			Credit 2	**LEED™ AP**	1

(Credits highlighted yellow are "Campus")

Project Totals (pre-certification estimates)

Yes	?	No
33	8	18

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-69 points

Sustainable Sites

Reclaimed Land

Before

After

Alternative Transportation

Construction Waste Management

Reflective Surfaces

3rd Floor Shell Space

Water Efficiency

The Commons Center will save an estimated 900,000 gallons of potable per year.

Proximity Sensor Faucets

Waterless Urinals

Dual Flush Toilets

Dish Water Conservation

Energy and Atmosphere

The Commons Center saves 28% of the energy used by similar buildings.

High Performance Glass

Daylight Harvesting

Efficient Kitchen Hoods

High Efficiency lighting

Ozone Friendly Refrigerants

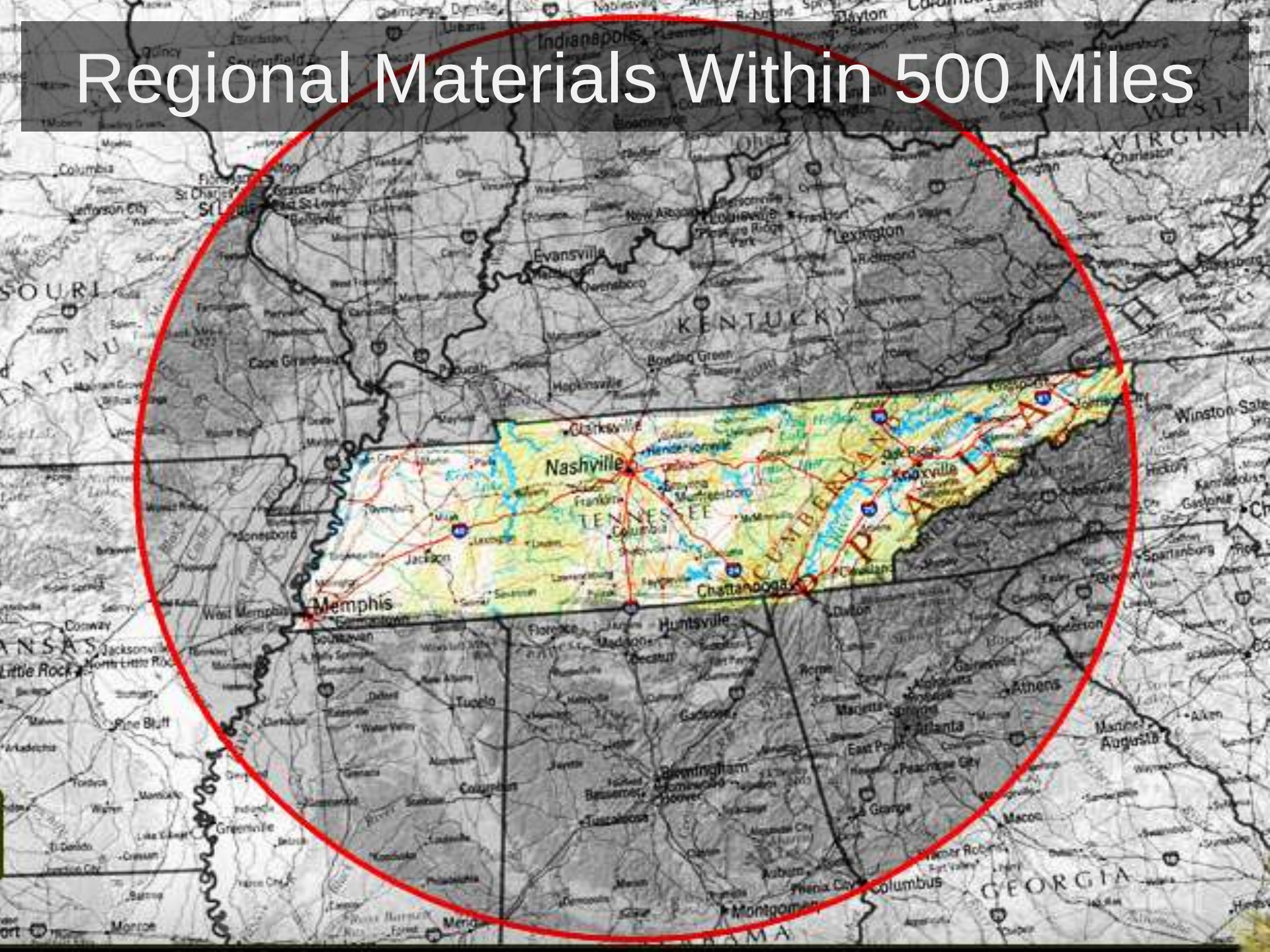
Programmable Sunshades

Materials and Resources

Reused Sandstone Pavers

Reused Library Chairs

Regional Materials Within 500 Miles



Recycling

Recycled Content in Materials

Building Reuse

Indoor Environmental Quality

Construction IAQ Management Plan

Daylight and Views

Smoke Free Building

Low VOC Adhesives and Paints

Innovation and Design

HVAC Condensate Collection

LEED-certified

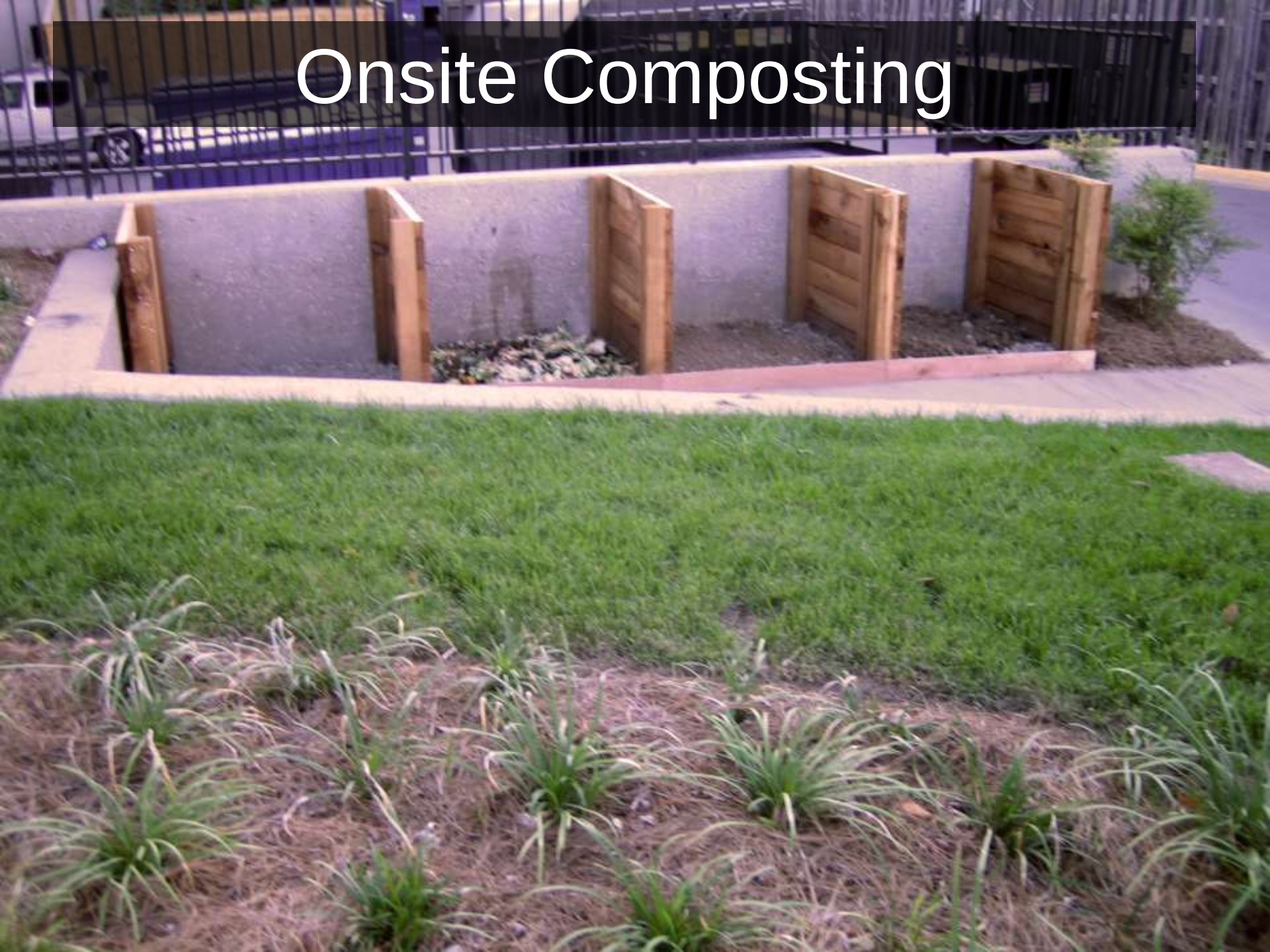
View The
Commons Center Overview

U.S. GREEN BUILDING COUNCIL MEMBER

Operational Benefits

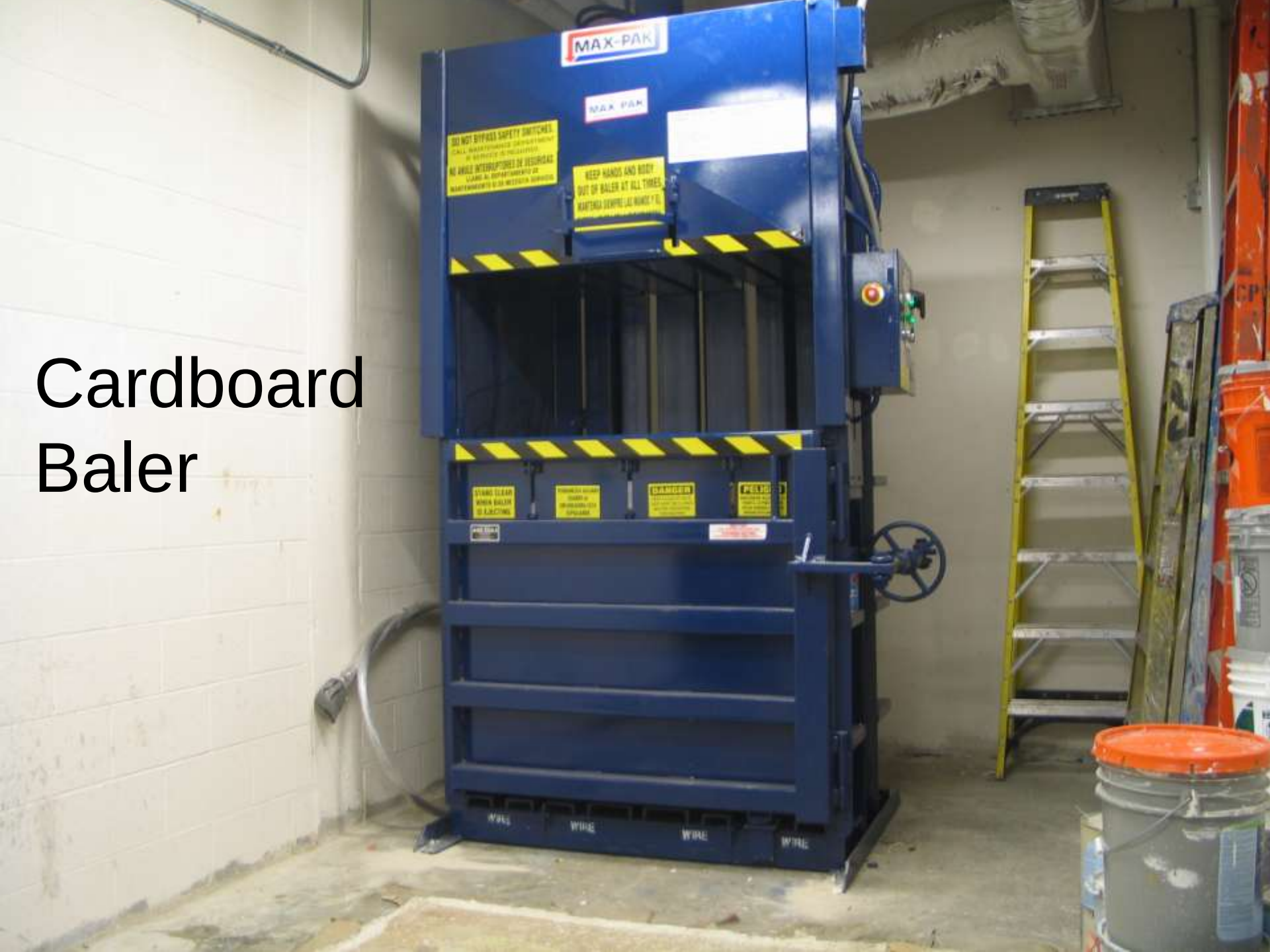
Hard China

Onsite Composting



Healthy Lifestyles

Cardboard Baler



Green Cleaning

Biodiesel

Pulper

The Common Center Project Team

Owner - Vanderbilt University

Architect – Bruner/Cott & Associates

MEP Engineers – Smith Seckman Reid Inc.

Structural Engineers – EMC Structural Engineers PC

Civil Engineers – Barge Cauthen & Associates

LEED Consultant and Commissioning – SSR,Cx

Construction Manager – Hardaway Construction Company

Increased Community Awareness

- Student and faculty tours
- Student workshop grants for sustainable living
- Commons development documentary
- Design and construction teams spread of experience through the industry.

Lessons Learned?

- Start LEED planning early in the project
- Work with a motivated and qualified team
- Check progress and get documentation throughout the process.

More Information

- www.vanderbilt.edu/sustainvu
- www.vanderbilt.edu/thecommons
- http://www.usgbc.org